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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,139	10/22/2003	Yoshikazu Takahashi	501558.20005	9158

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REED SMITH, LLP
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599 LEXINGTON AVENUE, 29TH FLOOR
NEW YORK, NY 10022-7650

EXAMINER

MRUK, GEOFFREY S

ART UNIT	PAPER NUMBER
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2853

DATE MAILED: 05/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/692,139	Applicant(s) TAKAHASHI, YOSHIKAZU	
	Examiner Geoffrey Mruk	Art Unit 2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 22 October 2003.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-13 is/are pending in the application.

 4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1-13 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on 22 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

 a) ☒ All b) ☐ Some * c) ☐ None of:

 1. ☒ Certified copies of the priority documents have been received.

 2. ☐ Certified copies of the priority documents have been received in Application No. _____.

 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>22 October 2003</u> .	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-5 and 7-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakamoto et al. (US 6,682,180 B2).

With respect to claim 1, Sakamoto discloses a droplet ejecting apparatus (Fig. 2, element 1), comprising:

- a channel unit (Fig. 5, element 114) having at least one pressure chamber (Fig. 9, element 112) which communicates, at a first end thereof, with a liquid supply manifold (Fig. 5, element 110) so as to be supplied with a liquid by the liquid supply manifold: and

- at a second end thereof, with a nozzle (Fig. 5, element 120) so as to eject a droplet of the liquid through the nozzle; and
- an actuator unit (Fig. 5, element 140) fixed to the channel unit, the actuator unit having a plurality of active portions (Fig. 6, array of element 109) which are opposed to said at least one pressure chamber of the channel unit and each of which includes at least one first electrode (Fig. 5, element 104) and at least one second electrode (Fig. 5, element 109), and
- a piezoelectric sheet (Fig. 5, element 108) interposed between the first and second electrodes, the plurality of active portions being deformed to change a volume of said at least one pressure chamber (Column 7, lines 10-18).

With respect to claim 2, Sakamoto discloses the respective piezoelectric sheets (Fig. 6, array of element 108) of the plurality of active portions (Fig. 6, array of element 109) comprise respective portions of a common piezoelectric sheet, and are polarized in a direction of thickness of the common piezoelectric sheet, and wherein when an electric field is applied to the piezoelectric sheet of each of the plurality of active portions in a same direction as the direction of polarization thereof, said each active portion is elongated in the direction of thickness of the common piezoelectric sheet (Column 7, lines 4-18, i.e. bimorph layered body).

With respect to claim 3, Sakamoto discloses the plurality of active portions (Fig. 9, array of element 109) comprise two active portions and wherein a distance between the two active portions is selected at a value which assures that, when the two active portions are elongated in the direction of thickness of the common piezoelectric sheet

(Fig. 9, element 108), a portion of the common piezoelectric sheet that is located between the two active portions is elongated in a same direction as the direction of elongation of the two active portions (Column 7, lines 4-18, i.e. bimorph layered body).

With respect to claim 4, Sakamoto discloses portion of the common piezoelectric sheet (Fig. 9, element 108) that is located between the two active portions (Fig. 9, element 109) is elongated in the same direction as the direction of elongation of the two active portions, by not less than 90% of an amount of elongation of each of the two active portions (Column 12, lines 20-64, i.e. elements 108 and 109 are equal in length).

With respect to claim 5, Sakamoto discloses an outer end portion of an outermost one of the plurality of active portions (Fig. 9, array of element 109) opposed to the pressure chamber (Fig. 9, element 112) is located at a position corresponding to a vicinity of an end portion of the pressure chamber (Fig. 9, element 3, i.e. side wall of element 3).

With respect to claim 7, Sakamoto discloses a ratio of a sum of respective areas of the plurality of active portions (Fig. 9, array of element 109) to an area equal to a product of a length of the pressure chamber (Fig. 9, element 112) and a width of each of the active portions as measured in a direction perpendicular to a lengthwise direction of the pressure chamber is not smaller than 0.7 and smaller than 1 (Column 12, lines 20-64).

With respect to claim 8, Sakamoto discloses the pressure chamber (Fig. 9, element 112) comprises an elongate pressure chamber (Fig. 9, element 112, i.e. rectangular in shape), and the plurality of active portions comprise two elongate active portions which

are distant from each other in a lengthwise direction of the elongate pressure chamber and each of which extends parallel to the elongate pressure chamber, and wherein the elongate pressure chamber has a first width, and each of the elongate active portions has a second width smaller than the first width (Column 12, lines 20-64).

With respect to claim 9, Sakamoto discloses a ratio of a sum of respective areas of the elongate active portions (Fig. 9, array of element 109) to an area equal to a product of the second width of said each elongate active portion and a length of the elongate pressure chamber is not smaller than 0.7 and smaller than 1 (Column 12, lines 20-64).

With respect to claim 10, Sakamoto discloses a ratio of a sum of respective lengths of the elongate active portions (Fig. 9, array of element 109) to a length of the elongate pressure chamber is not smaller than 0.7 and smaller than 1 (Column 12, lines 20-64).

With respect to claim 11, Sakamoto discloses the channel unit (Fig. 5, element 114) has a plurality of pressure chambers (Fig. 5, element 112) which communicate, at respective first ends thereof, with a common liquid supply manifold (Fig. 5, element 110) so as to be supplied with a liquid by the common liquid supply manifold and, at respective second ends thereof, with respective nozzles (Fig. 5, element 120) so as to eject respective droplets of the liquid through the respective nozzles (Column 1, lines 44-67; Column 2, lines 1-29).

With respect to claim 12, Sakamoto discloses the common liquid supply manifold (Fig. 5, element 110) comprises an ink supply manifold which supplies an ink as the liquid, and wherein the actuator unit (Fig. 5, element 140) changes a volume of each of the pressure chambers (Fig. 5, element 112) of the channel unit, so as to eject, from a

corresponding one of the nozzles (Fig. 5, element 120), a droplet of ink as the droplet of liquid and thereby form an image on a recording medium (Column 1, lines 44-67; Column 2, lines 1-29).

With respect to claim 13, Sakamoto discloses a droplet ejecting apparatus (Fig. 2, element 1), comprising:

- a channel unit (Fig. 5, element 114) having at least one elongate pressure chamber (Fig. 5, element 112, i.e. rectangular in shape) which communicates, at a first end thereof, with a liquid supply manifold (Fig. 5, element 110) so as to be supplied with a liquid by the liquid supply manifold; and
- at a second end thereof, with a nozzle (Fig. 5, element 120) so as to eject a droplet of the liquid through the nozzle; and
- an actuator unit (Fig. 5, element 140) fixed to the channel unit, the actuator unit having a plurality of elongate active portions (Fig. 6, array of element 109) which are opposed to said at least one elongate pressure chamber of the channel unit and each of which includes at least one first electrode and at least one second electrode, and
- a piezoelectric sheet (Fig. 5, element 108) interposed between the first (Fig. 5, element 104) and second electrodes (Fig. 5, element 109), the plurality of elongate active portions being deformed to change a volume of said at least one elongate pressure chamber (Column 7, lines 10-18), wherein

- a ratio of a sum of respective lengths of the elongate active portions to a length of the elongate pressure chamber is not smaller than 0.7 and smaller than 1 (Column 12, lines 20-64).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto et al. (US 6,682,180 B2) in view of Sasaki et al. (US 6,719,409 B2).

Sakamoto discloses a pressure chamber (Fig. 9, element 112) that comprises an elongate pressure chamber (Fig. 9, element 112, i.e. rectangular in shape), and the plurality of active portions (Fig. 9, array of element 109) comprise two active portions that are distant from each other by a predetermined distance in a lengthwise direction of the elongate pressure chamber.

Sakamoto fails to disclose the outer end portion of at least one of the two active portions is located at a position inwardly distant from at least one of lengthwise opposite ends of the elongate pressure chamber by not more than 50% of said predetermined distance.

Sasaki discloses "the area of the piezoelectric plate is 0.5 or more and 1.0 or less of the area of the opening part of the pressure chamber" (Column 2, lines 40-43).

At the time of the invention, it would have been obvious for one of ordinary skill in the art to use the teachings of Sasaki in the ink jet of Sakamoto. The motivation for doing so would have been "by using the piezoelectric actuator of the present invention, it is easily possible to realize a thin-sized and efficient pressure pump for the ink jet printer head" (Column 2, lines 16-18).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Geoffrey Mruk whose telephone number is (571) 272-2810. The examiner can normally be reached on 7am - 330pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GSM

4/22/2005

GM


MANISH S. SHAH
PRIMARY EXAMINER

4/29/05